Impact of Atopic Dermatitis on the Quality of Life of Nigerian Children: A Hospital-based Cross Sectional Study.

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ABSTRACT

Background: Atopic Dermatitis (AD) is the most common inflammatory skin disease in childhood. A skin disorder with a relapsing course, AD exerts a significant disease burden on affected children. However there is a dearth of knowledge on the impact of AD on the quality of life (QOL) of affected children in Nigeria. The aim of this study was to examine the impact of AD on QOL in children of various age groups, to identify relationship between patient variables, disease severity and the QOL in AD.

Method: Children with a diagnosis of AD identified by the United Kingdom Working Party (UKWP) diagnostic criteria were recruited from a dermatology clinic over a 6 month period. English and Yoruba language versions of the Infants' Dermatitis Quality of Life Index (IDQOL) and the Children's Dermatology Life Quality Index (CDLQI) were used to determine the QOL of the subjects. AD severity was evaluated using the Objective Scoring of Atopic Dermatitis (obj-SCORAD) index was used.

Results: 47 subjects with AD were identified. The age range was from newborn to 16 years. The median IDQOL score was 6.0(3.0-15.5; n = 25) and the median CDLQI score was 9.5(7.75-17.75; n = 22). The mean obj-SCORAD score was 34.4 ± 17.2. Question on itching was the highest scoring question in both groups of children. Greater QOL scores were significantly correlated with higher AD severity scores as estimated by the obj-SCORAD.

Conclusion: The study confirms that AD impairs the QOL of affected children in all age-groups. QOL assessments help to give relevant information from the patient's perspective which will help improve the understanding the situation of individuals with AD.

Keywords: atopic dermatitis, QOL, IDQOL, CDLQI, obj-SCORAD, children.

INTRODUCTION:

Atopic Dermatitis (AD) is an inflammatory skin condition predominantly observed in children and affects 5–20% of children worldwide.[1] Recent studies have reported an increase in the prevalence of AD worldwide which has been attributed to changes in lifestyle, nutrition, and other environmental factors.[2]

The chronic and recurrent nature of AD (characterised by flares and remissions), intense pruritus, association with asthma and allergic rhinoconjuctivitis (atopic triad) can have significant impact on the patients and their families.[3] In children, the most troublesome symptom is itching. The effect of AD on sleep, primarily related to night-time itching and scratching, is often considerable. Children may lose up to 2 hours of sleep. Sleep in school-aged children with AD studied with home polysomnography was found to have frequent awakenings associated with scratching episodes and reduced sleep efficiency compared with healthy controls. Poor school performance has also been documented in affected children due to daytime drowsiness and inability to focus. Suggested reasons include poor sleep due to pruritus and daytime use of sedating oral antihistamines to alleviate the physical discomfort. Parents of young children with AD describe their children as being clingy, fearful and frustrated as the presence of itchy, painful and weepy lesions may result in discomfort or pain on touch which may impair parent-child bonding.

School children are more aware of their appearance and may choose to abstain from play activities or wear certain clothes in order to avoid embarrassment. This may affect relationships with peers and teachers. Also, the demands of care can negatively impact spousal relationships and interfere with the care of other siblings. Lawson et al evaluated the burden of care among parents of children with AD and observed that 71% of parents felt psychological pressures including guilt, exhaustion, frustration, resentment and helplessness while 64% of parents admitted to having their sleep disturbed by night-time itching and scratching of their child.

Health-related quality of life (HRQL) denotes a state of an individual's QOL pertaining to health and disease and/or its treatment. HRQL measurements are needed for comparison of alternate treatments, provision of information for evaluation of survival data, allocation of resources in health care, auditing of health services and as aids in management decisions. Quality of life (QOL) can also be used to assess the burden of illness and the outcomes of related medical treatments.

The DQLI is the most frequently used dermatology-specific QOL instrument in randomised clinical trials in dermatology. It has been modified for use in children aged less than 5 years as the Infant's Dermatitis Quality of Life Index (IDQOL). Similarly, the Children's Dermatology Quality of life Index (CDQLI) has been adapted for use in schoolchildren aged 5-16 years. Akinboro validated the CDLQI in a study of children with tinea capitis in a rural community in Oshogbo, Nigeria making it suitable for use in Nigeria.

The impact of AD on the QOL of affected children is well recognised in developed countries. However, these findings cannot be extrapolated to children in developing countries. Hence, the aim of this study was to examine the impact of AD on QOL in Nigerian children of various age groups, to identify relationship between patient variables, disease severity and the QOL in AD. Information obtained from this study will aid in improving the holistic approach to patient care through a better understanding of the disease burden and identification of patients in need of social and psychological support. This will promote better patient compliance and provide additional data for proper healthcare planning.

MATERIALS AND METHODS

This cross-sectional study was conducted between November 2012 and May 2013 in the dermatology clinic of the Lagos University Teaching Hospital, Lagos state, Nigeria. Ethical approval was obtained from the Hospital research and Ethics Committee. The sample in this study was drawn from 228 children aged <16 years who attended the clinic during the study period. Participants were provided with detailed information about the study and assured that confidentiality would be ensured. Inclusion criteria were diagnosis of AD, as formed according to the UK Working Party's Diagnostic Criteria, age limits of the children (from newborns to 18 years), and oral and written informed consent. Disease severity was estimated by the same dermatologist using the objective SCORing of Atopic Dermatitis (Obj-SCORAD) index.* All children were divided into two age groups: less than 5 years and 5-16 years.

Case Definition

For the purpose of this study, the United Kingdom Working Party (UKWP) criteria for the diagnosis of Atopic Dermatitis was used to identify cases. A diagnosis of AD is made in the presence of a pruritic rash and three or more of the following features:

(i) a history of rash in the skin creases (fold of the elbow, behind the knees, front of the ankles and around the neck)
(ii) a personal or family history of asthma and hay fever
(iii) history of generalized dry skin (xerosis)
(iv) onset before the age of two years and
(v) visible flexural dermatitis

These set of criteria have been validated in Nigeria by Odusote.

Data Collection

Demographic data of all individuals recruited for the study - including biodata and composite variables (father's and mother's occupation and level of education) to assess the socioeconomic status of the patient were recorded.

Quality of Life (QOL) Assessment

QOL was assessed among all recruited subjects using the English/Yoruba versions of either the Infant's Dermatology Quality of Life index (IDQOL) for children aged less than five years or the Children's Dermatology Quality of Life index (CDQLI) for children aged 5-16 years depending on the child's age. The quality of life measures were self-administered. Prior to answering the QOL measures, the primary investigator had explained to the children/care-giver how to fill the questionnaires. Specifically, for children less than five years of age the IDQOL questionnaire was filled by parents/guardians. Children aged 5–16 years answered the CDQLI questionnaires: the parents/guardians helped the younger children to understand and answer the questionnaires while the older children who understood answered the questions themselves.

Infant's Dermatology Quality of Life index (IDQOL)

This quality of life measure was used for children aged less than five years and was completed by the parent or caregiver. The IDQOL includes 10 questions addressing symptoms and difficulties with mood, sleep (two questions), play, family activities, mealtimes, treatments, dressing and bathing over the last one week. Each question of the IDQOL was answered by "not at all," "only a little," "quite a lot," or "very much" and was scored 0, 1, 2 or 3, respectively

Children's Dermatology Quality of Life Index (CDLQI)

It was used to measure QOL in children aged 60 -192 months (5-16 years). It comprised a 10-question questionnaire related to symptoms of AD, which are classified to the following subscales: symptoms and

feelings (questions 1 and 2), leisure (questions 4, 5, and 6), school or holidays (question 7), personal relationships (questions 3 and 8), sleep (question 9), and treatment (question 10) within the previous week. Each question of the CDLQI was answered by "not at all," "only a little," "quite a lot," or "very much" and was scored 0, 1, 2 or 3, respectively. The one exception to this scoring is found in question 7 where the answer "very much" is replaced with "prevented school" and was similarly scored 0 to 3. (Appendix V and VI)

For both QOL measures the total score was calculated by adding the scores of the 10 questions. In the scoring system, the higher the score, the more the QOL of the subject is impaired. The highest possible score is 30, while the lowest possible score is 0. Total QOL scores of 0–10, 11–20 and >20 represent mild, moderate and severe impairment respectively.

Assessment of disease severity

The objective-SCORAD was used to assess AD disease severity where the higher the value, the worse the skin condition. It is a combination of two items: Topography or extent of skin involvement (A) and intensity of the dermatitis (B).

Individuals with AD were taken to a well lit, quiet, private and warm room. Ensuring parental consent/assent were still valid, these subjects were then asked to undress to allow for close observation of the skin and then examined by the primary investigator.

To assess disease extent/surface area (A), affected areas of skin were plotted on the Wallace rule of nines chart body chart section of the objective-SCORAD to estimate a total percentage area affected. Disease extent is graded from 0 - 100. For disease intensity (B), the primary investigator assessed six clinical signs – erythema, oedema/induration, excoriation, lichenification, oozing/crusting and dryness (xerosis) at a single representative (the most affected) site. Each sign was graded from 0 to 3 (0 – absence, 3 - severe).Disease intensity was graded as 0 – 18. SCORAD is a weighted index, with more emphasis on the intensity (multiplying by a factor of 3.5) but less weight on the extent (multiplying by a factor of 0.2). The highest possible score is 83.

The objective-SCORAD score was calculated using the formula (A/5 + 7B/2). Total objective-SCORAD scores were classified as <15 (mild), 15-40 (moderate), >40 (severe) according to the recommendation by Kunz et al. (Appendix VII)

Translation Protocol

A written permission was obtained from the owners of IDQOL questionnaires for translation and the use in the study. Two forward translations into Yoruba language were carried out by two independent bilingual native Yoruba translators and then, an agreement on a translation was reached. This consensus version was translated back into English by third and fourth independent bilingual translators. These two distinct translations were reviewed by the copyright holders. In addition, the layout of the questionnaire was graphically as close to the original English version.

Socioeconomic Status (SES):

Parents socioeconomic status was classified into upper(I and II); middle (III) and lower (IV and V) groups using the method described by Oyedeji. This method of classification uses the parents' level of education and occupation to categorise the parents into socioeconomic groups I – V which was grouped as above.

Table 1. Sociodemographic characteristics of study population.

	Subjects n =228	AD n = 47
Age (months)		
0 – 59	85(37.2%)	25(53.2%)
60 - 120	92(40.4%)	18(38.3%)
121 – 192	51(22.4%)	4(8.5%)
Mean Age (months)		56.6 ± 43.6
Sex		
Male	98(43%)	24(51.1%)
Female	130(57%)	23(48.9%)
Parent's Socioeconomic Status		
Upper	120(52.6%)	26(55.3%)
Middle	67(29.4%)	11(23.4%)
Lower	41(18.0%)	10(21.3%)

Table 2. IDQOL and CDLQI scores of children with AD

IDQOL items	Median(IQR) n = 25	CDLQI items	Median(IQR) n = 22
Itching/scratching	2.00 (1.00 - 3.00)	Itching/Scratching	3.00 (2.75 – 3.00)
Mood	1.00 (0.00 - 2.50)	Embarrassment	2.00 (1.00 – 3.00)
Time to sleep	1.00 (0.00 - 2.00)	Friendships	1.00 (0.00 – 2.25)
Sleep disturbance	0.00 (0.00 - 2.00)	Clothing	0.00 (0.00 – 1.00)
Playing	0.00 (0.00 - 1.00)	Playing	2.00 (0.00 – 3.00)
Family Activities	0.00 (0.00 - 1.00)	Sporting Activities	0.00 (0.00 – 1.25)
Mealtimes	0.00 (0.00 - 1.00)	School	1.00 (0.00 – 2.00)
Treatment	1.00 (0.00 - 2.00)	Teasing/Bullying	0.50 (0.00 – 2.00)
Dressing	1.00 (0.00 - 2.00)	Sleep	1.00 (0.00 – 2.25)
Bathtime	0.00 (0.00 - 1.50)	Treatment	1.00 (0.00 – 2.00)
Total IDQOL score	6.00 (3.00 - 15.50)	Total CDLQI score	9.50 (7.75 – 17.75)

STATISTICAL ANALYSIS:

Data was collected and stored on an electronic database. Statistical analysis was performed using the SPSS package for windows software version 20.0. Disease severity groups (mild, moderate, severe) were classified in function according to the objective-SCORAD ranges. Normally distributed quantitative variables were analysed using t-test, ANOVA and Pearson's rank correlations. For skewed distribution, the median was used as the measure of central tendency while Mann-Whitney U test, Kruskal-wallis test, Spearman's rank correlations were utilized.

Specifically, Total QOL (CDLQI and IDQOL) scores and items were compared between the AD and non-AD (control) groups. Correlations were carried out to determine associations between sociodemographic variables (age, gender and socioeconomic status) disease severity and total QOL scores. Further analysis was carried out to determine what variables were associated with severe QOL impairment which was taken as a QOL score greater than 20 (severe QOL impairment). QOL scores of individuals with AD (according to age, gender and AD severity groups) were compared. ($p < 0.05$ was considered statistically significant).

Table 3. Distribution of disease severity among children with AD

Disease severity	Objective-SCORAD (Mean ± SD)	Frequency	Percentage
Mild	12.8 ± 2.90	5	10.6%
Moderate	25.2 ± 7.35	24	51.1%
Severe	52.5 ± 10.8	18	38.3%
Total	34.4 ± 17.2	47	100.0%

The mean obj-SCORAD score was 34.4 ± 17.2. Most children in the study had moderate disease severity. (Table 3.)

Table 4. Correlation matrix between sociodemographic variables (age, gender and socioeconomic status), QOL scores and disease severity (obj-SCORAD).

		Age	Gender	Socioeconomic status	QOL	Obj-SCORAD
Age	r_s	-	-0.186	-0.093	0.232	-0.043
	p		0.212	0.536	0.116	0.774
Gender	r_s	-0.186	-	-0.087	-0.212	0.113
	p	0.212		0.560	0.152	0.450
Socioeconomic status	r_s	-0.093	-0.087	-	0.040	0.279
	p	0.536	0.560		0.778	0.058
QOL	r_s	0.232	-0.212	0.040	-	0.328
	p	0.116	0.152	0.778		0.024
Obj-SCORAD	r_s	-0.043	0.113	0.279	0.328	-
	p	0.774	0.450	0.058	0.024	

RESULTS

A total of 228 children were seen during the study period of these 47 AD cases were identified using the UKWP diagnostic criteria and were included in the study. Twenty-five were less than 5 years of age while 22 were between 5-16 years. Demographic information for the cohort is listed in Table 1.

Infant's Dermatology Quality of Life index (IDQOL)

The median IDQOL score was 6.0(3.0-15.5; n = 25). Questions on itching/scratching, mood, time to sleep, treatment and dressing were the highest scoring questions. (Table 2)

Children's Dermatology Quality of Life index (CDLQI)

The median CDLQI score was 9.5(7.75-17.75; n = 22). The highest scoring CDLQI items were questions on itching/ scratching, embarrassment and play. (Table 2.)

Using the spearman's correlation, there was no significant correlation was observed between QOL scores and age, gender and socioeconomic status. However a significant correlation was observed between QOL scores and disease severity (Obj-SCORAD).(rs = 0.328, p = 0.024)There was no significant correlation between disease severity (obj-SCORAD scores) and age, gender and socioeconomic status. (Table 4.)

DISCUSSION

Although the distribution of central tendency was skewed, the mean (SD) QOL score for children with AD in this study was 10.5(7.5) which was higher than scores of 9.2(7.8) observed by Lewis-Jones and 7.7(5.6) reported by Beattie *et al* among children with AD in paediatric dermatology clinics. However, the observed mean score was comparable to a mean (SD) score of 9.8(4.5) observed among children with AD in Egypt. Alvarenga et al reported a mean QOL score of 9.2 among children with AD in Brazil. The high mean QOL score observed in the index study may be attributed to the high proportion of individuals with moderate to severe disease which was the case in the Egyptian study as over 80% of subjects had moderate to severe disease in both studies. Lower mean QOL scores have been documented among children with

AD recruited from general practice clinics due to a lower proportion of severe cases.

The highest scoring IDQOL questions among children less than 60 months with AD were questions for 'itching', 'mood', 'time to sleep', 'treatment' and 'problems with dressing'. Kim et al reported itching, mood and time to sleep as the most affected questions among children less than 4 years with AD in Korea. A similar observation was made by van Valburg et al among children with AD in a general practice clinic in the Netherlands.

The highest scoring questions in the CDLQI among children with AD were 'itching', 'feelings of embarrassment' and 'playing'. In addition, other questions such as sleep and school work were scored higher among the children with AD. Kim et al reported itching, sleep and feelings of embarrassment as the most affected problems among children with AD aged 5-16 years. A similar observation was made by Ben-Gashir et al among children in the United Kingdom.

Among the older children with AD, pruritus was severe enough to disturb sleep. Previous studies have reported that night time itching in children with AD affects both the quality and quantity of patients' sleep. This may cause tiredness, irritability, problems with concentration and learning resulting in poor performance at school. Children affected by AD felt more embarrassed/self-conscious about their skin problem compared to the controls and this was severe enough to interfere with playtime and school. This corroborates reports in numerous studies among children with AD in developed countries. Importantly, the question on 'itching' was highest scoring question in both questionnaires. This observation is in agreement with observations in previous studies which have established a significant association between QOL impairment and pruritus in AD.

The impact of age, gender socioeconomic status and disease severity as determinants of QOL was also evaluated. Disease severity (obj-SCORAD score) was the only factor associated with QOL impairment in children with AD. A significant positive correlation was observed between obj-SCORAD scores and QOL scores (that is the greater the disease severity, the greater the QOL impairment). This is in agreement with other studies among children with AD Italy , Egypt and the United Kingdom. Hassab-el-Naby in Egypt evaluated 100 school-aged children with AD recruited from a dermatology clinic observed significantly greater QOL impairment with increasing disease severity. In contrast, van Valburg et al in a study of pre-school children with AD recruited from a general practice clinic reported no significant association between QOL scores and obj-SCORAD scores which was probably due to proxy estimation of QOL and a larger proportion of individuals with mild disease.

Few studies have utilised the objective-SCORAD (obj-SCORAD) index to evaluate the severity of atopic dermatitis among children in sub-Saharan Africa. The mean (SD) obj-SCORAD score in this study was 34.4(17.2) which was comparable to 27.9(8.3) observed in Egypt. This is not surprising as both studies were carried out in dermatology clinics. However, lower mean obj-SCORAD scores were reported in general practice clinics in the United Kingdom' and the Netherlands. The high proportion of individuals with moderate to severe disease may be attributed to delay in presentation to the dermatologist as there are few dermatologists in developing countries with most within the tertiary hospitals. Monroe et al noted that in developing countries over 90% of cutaneous conditions are treated by primary care providers with little or no dermatology training resulting in high failure rates which is not the case in developed countries. In addition, Emodi et al noted that the ability of parents to purchase any drug over the counter may also contribute to self medication. The ineffective treatment received at primary care centres in developing countries like Nigeria may lead to topical application of herbal preparations and abuse of potent topical corticosteroid ointments which are easily obtained over the counter. Such interventions may aggravate AD by acting as sensitizers. Therefore in order to reduce the burden of care at the tertiary centres, there is a need for continued education of primary care providers on current treatment guidelines to ensure effective management of skin conditions including AD.

The use of disability measures will provide additional information about QOL impairment as limitations associated with AD may not be easily recognised by healthcare providers. Such information from the patient's perspective will aid in healthcare decision-making which will enhance comprehensive care and patient compliance.

LIMITATIONS

The study was carried out in a specialist dermatology clinic which may introduce a selection bias. As such, prevalence rates and quality of life should be interpreted with caution when extrapolated to general practice clinics/general population.

The possibility of information bias during data collection on quality of life as a proxy (parent/caregiver) answered QOL questions for the children less than five years and also helped/guided the children between 5-10 years to answer the questions.

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